# Index. Volume 39

Abnormal seedlings, 310 Adams, Arthur W., 244 Adams, D.C., 361 Adams, John C., 369 Adnosine monophosphate, 40 Agnew, William, 135 Agropyron cristatum, 40, 261 Agropyron desertorum, 261, 264, 300, 443 Agropyron smithii, 509 Agropyron spicatum (Pursh), 175 Agropyron spp., 43 Alfalfa, 52, 59 Alfalfa hay, 361 Alfalfa survival and vigor in rangeland grazed by sheep, 59 Alkali sacaton, 63 Alkaloids, 29, 344 Alpaca food habits, 424 Alpine vegetation, 392 Anacua, 450 Anagyrine in western American lupines, 29 Andariese, Steven W., 472 Anderson, D.M., 320 Anderson, Jay E., 152, 156 Angell, Raymond F., 233 Animal nutrition, 8, 361, 421, 424 Animal units, 470, 471 Annual medics and related species as reseeding legumes for northern Utah pastures, 52 Annual range, 348, 482 Apa, Anthony D., 298 Arid lands, 331 Aristida pungens Desf., 348 Aristida spp., 505 Arno, Stephen F., 240, 272 Artemisia spp., 152, 166 Artemisia tridentata, 141, 147, 156, 160, 314, 334, 338 Arthun, Dave, 2 Asay, K.H., 261, 300 Aspen, 13 Assessment of spring defoliation to improve fall forage quality of bluebunch wheatgrass (Agropyron spicatum), 175 Asset replacement, 378 Astragalus cicer L., 457 Astragalus miser, 130 Astragalus, spp., 341 Atrazine, 72 Atriplex canescens, 43, 460 Atriplex, spp., 104

Ayers, E.L., 421

Austin, Dennis D., 18, 514

Average daily weight gain (cattle), 182

Bacteria (water), 369 Bagley, Calvin F., 431 Bahamonde, Nora, 22 Bailey, A.W., 13, 536 Balliette, John F., 160 Bareiss, Laura J., 259 Barker, Jerry R., 147 Barth, R.C., 108 Bashaw, E.C., 547 Belton, J. Tim, 409 Bentonite, 113 Berdahl, J.D., 59 Berg, William A., 122 Birds (nongame), 251 Biomass analysis, 91, 187, 338, 472 Biomass estimation for four common grass

species in northern Arizona ponderosa pine, WW-Spar' Old World bluestems, 303 Biondini, Mario, 396 Blackburn, W.H., 486, 491, 500, 505 Blake, Martin, 194 Bluegrama, 40 Bluegrass, 531 Bluestem (creeping), 223, 518 Bluestem (little), 264 Bluestems (Old World), 300, 303 Bobwhite, 259 Bofedal, 424 Book Reviews, 95, 190, 286, 383, 479, 566 Botanical composition, 43, 217, 283, 509 Botanical composition and diet quality of cattle under a short duration grazing system, Botanical composition and nutritional quality of alpaca diets in two Andean rangeland communities, 424 Botanical composition of the diet of freeranging cattle on an alpine range in Austra-Bothriochloa spp., 300, 303 Bouteloua curtipendula, 264, 460, 505 Bouteloua gracilis, 40, 371, 434, 509 Bovey, B.W., 547 Bowns, James E., 431 Boyd, W.E., 268 Bradford, J.A., 303 Brakensiek, D.L., 408 Brand, Michael D., 434 Britton, C.M., 399, 403 Brock, John H., 331 Brown, M.A., 197 Browse harvest technique, 187 Browsing, 152 Brush management, 31, 67, 237, 438 Bryant, Fred C., 237, 424 Buchloe dactyloides, 135 Buffalograss, 135 Buffelgrass, 547 Burn, 314 Burning (prescribed), 327 Burns, 76 Burr clover, 52 Cabral, Diego R., 187 Caldwell, Martyn M., 443

California annual grassland, 482 Cannula (esophageal), 93 Cynomys ludovicianus, 135, 249 Capra hircus, 24 Carande, Vilma, 88 Carpenter, Len H., 470 Carrying capacity, 182
Cattle and sheep diets under short-duration grazing, 217 Cattle behavior, 212, 428 Cattle feeding and resting patterns in a foothills riparian zone, 212 Cattle ranch operating costs, 290 Cattle response to continuous and seasonal grazing of California annual grassland, 482 Cattle trampling, 259, 414 Cattle weight gains in relation to stocking rate on rough fescue grassland, 182 Causes and economic effects of mortality in livestock guarding dogs, 293

Ceanthus spp., 521 Celtis pallida, 562

Cenchrus ciliaris L., 547 Center, D. Michael, 475 Ceratoides lanata, 152, 187 Cercidium floridum, 108 Cercocarpus ledifolius, 241 Cervus elaphus, 22 Chaining, 237 Changes in bacterial populations in Wyoming mountain streams after 10 years, 369 Chrysothamnus viscidiflorus, 156, 334 Clambey, Gary K., 496 Claypool, P.L., 354 Clover (subterranean), 454 Cochran, R.C., 361 Cold-temperature germination of Elytrigia repens × Pseudoroegneria spicata hybrids, Coleophora parthenica, 281 Colin:us virginianus, 259 Combination of weight estimates with clipped sample data, 88 Comparative infiltration rates and sediment production on fertilized and grazed blue grama rangeland, 371 Comparison of average variable costs of private vs. public land ranches in southeastern Montana, 290 Conley, W.H., 320 Construction of an inexpensive liquid resin esophageal cannula for goats, 93

Cooley, K.R., 81 Coppinger, Raymond P., 293 Cordgrass, 233 Correlation of rangelands brush canopy cover with Landsat MSS data, 268 Cottonseed meal, 361 Cover (basal), 166 Cover (plant), 91 Covington, W. Wallace, 472 Cox, Jerry R., 540 Coyne, P.I., 303 Crested wheatgrass, 300

Crofts, Kent A., 118

Crooked calf disease, 29 Crossbreeding, 421 Croy, L.I., 276 Crude protein, 344 Cubed alfalfa hay or cottonseed meal-barley as supplements for beef cows grazing fallwinter range, 361 Cultural practices for establishing fourwing saltbush within perennial grass stands, 460 Currie, P.O., 361, 386

Data processing, 194 Dating past fires in curlleaf mountain-mahogany communities, 240 Davis, A.M., 29 Davis, C.A., 320 Davis, Lee G., 454 Dean, John G, 228 Deer and cattle competition, 18 Deer (mule), 18, 244, 521 Deer (red), 22 Deerbrush, 521 Defoliation (season of), 175 Dendrochronology, 241 Desert range, 531 Dewey, D.R., 261 Diet of guanaco and red deer in Neuquen Province, Argentina, 22

# Index. Volume 39

Abnormal seedlings, 310 Adams, Arthur W., 244 Adams, D.C., 361 Adams, John C., 369 Adnosine monophosphate, 40 Agnew, William, 135 Agropyron cristatum, 40, 261 Agropyron desertorum, 261, 264, 300, 443 Agropyron smithii, 509 Agropyron spicatum (Pursh), 175 Agropyron spp., 43 Alfalfa, 52, 59 Alfalfa hay, 361 Alfalfa survival and vigor in rangeland grazed by sheep, 59 Alkali sacaton, 63 Alkaloids, 29, 344 Alpaca food habits, 424 Alpine vegetation, 392 Anacua, 450 Anagyrine in western American lupines, 29 Andariese, Steven W., 472 Anderson, D.M., 320 Anderson, Jay E., 152, 156 Angell, Raymond F., 233 Animal nutrition, 8, 361, 421, 424 Animal units, 470, 471 Annual medics and related species as reseeding legumes for northern Utah pastures, 52 Annual range, 348, 482 Apa, Anthony D., 298 Arid lands, 331 Aristida pungens Desf., 348 Aristida spp., 505 Arno, Stephen F., 240, 272 Artemisia spp., 152, 166 Artemisia tridentata, 141, 147, 156, 160, 314, 334, 338 Arthun, Dave, 2 Asay, K.H., 261, 300 Aspen, 13 Assessment of spring defoliation to improve fall forage quality of bluebunch wheatgrass (Agropyron spicatum), 175 Asset replacement, 378 Astragalus cicer L., 457 Astragalus miser, 130 Astragalus, spp., 341 Atrazine, 72 Atriplex canescens, 43, 460 Atriplex, spp., 104

Ayers, E.L., 421

Austin, Dennis D., 18, 514

Average daily weight gain (cattle), 182

Bacteria (water), 369 Bagley, Calvin F., 431 Bahamonde, Nora, 22 Bailey, A.W., 13, 536 Balliette, John F., 160 Bareiss, Laura J., 259 Barker, Jerry R., 147 Barth, R.C., 108 Bashaw, E.C., 547 Belton, J. Tim, 409 Bentonite, 113 Berdahl, J.D., 59 Berg, William A., 122 Birds (nongame), 251 Biomass analysis, 91, 187, 338, 472 Biomass estimation for four common grass

species in northern Arizona ponderosa pine, WW-Spar' Old World bluestems, 303 Biondini, Mario, 396 Blackburn, W.H., 486, 491, 500, 505 Blake, Martin, 194 Bluegrama, 40 Bluegrass, 531 Bluestem (creeping), 223, 518 Bluestem (little), 264 Bluestems (Old World), 300, 303 Bobwhite, 259 Bofedal, 424 Book Reviews, 95, 190, 286, 383, 479, 566 Botanical composition, 43, 217, 283, 509 Botanical composition and diet quality of cattle under a short duration grazing system, Botanical composition and nutritional quality of alpaca diets in two Andean rangeland communities, 424 Botanical composition of the diet of freeranging cattle on an alpine range in Austra-Bothriochloa spp., 300, 303 Bouteloua curtipendula, 264, 460, 505 Bouteloua gracilis, 40, 371, 434, 509 Bovey, B.W., 547 Bowns, James E., 431 Boyd, W.E., 268 Bradford, J.A., 303 Brakensiek, D.L., 408 Brand, Michael D., 434 Britton, C.M., 399, 403 Brock, John H., 331 Brown, M.A., 197 Browse harvest technique, 187 Browsing, 152 Brush management, 31, 67, 237, 438 Bryant, Fred C., 237, 424 Buchloe dactyloides, 135 Buffalograss, 135 Buffelgrass, 547 Burn, 314 Burning (prescribed), 327 Burns, 76 Burr clover, 52 Cabral, Diego R., 187 Caldwell, Martyn M., 443

California annual grassland, 482 Cannula (esophageal), 93 Cynomys ludovicianus, 135, 249 Capra hircus, 24 Carande, Vilma, 88 Carpenter, Len H., 470 Carrying capacity, 182
Cattle and sheep diets under short-duration grazing, 217 Cattle behavior, 212, 428 Cattle feeding and resting patterns in a foothills riparian zone, 212 Cattle ranch operating costs, 290 Cattle response to continuous and seasonal grazing of California annual grassland, 482 Cattle trampling, 259, 414 Cattle weight gains in relation to stocking rate on rough fescue grassland, 182 Causes and economic effects of mortality in livestock guarding dogs, 293

Ceanthus spp., 521 Celtis pallida, 562

Cenchrus ciliaris L., 547 Center, D. Michael, 475 Ceratoides lanata, 152, 187 Cercidium floridum, 108 Cercocarpus ledifolius, 241 Cervus elaphus, 22 Chaining, 237 Changes in bacterial populations in Wyoming mountain streams after 10 years, 369 Chrysothamnus viscidiflorus, 156, 334 Clambey, Gary K., 496 Claypool, P.L., 354 Clover (subterranean), 454 Cochran, R.C., 361 Cold-temperature germination of Elytrigia repens × Pseudoroegneria spicata hybrids, Coleophora parthenica, 281 Colin:us virginianus, 259 Combination of weight estimates with clipped sample data, 88 Comparative infiltration rates and sediment production on fertilized and grazed blue grama rangeland, 371 Comparison of average variable costs of private vs. public land ranches in southeastern Montana, 290 Conley, W.H., 320 Construction of an inexpensive liquid resin esophageal cannula for goats, 93

Cooley, K.R., 81 Coppinger, Raymond P., 293 Cordgrass, 233 Correlation of rangelands brush canopy cover with Landsat MSS data, 268 Cottonseed meal, 361 Cover (basal), 166 Cover (plant), 91 Covington, W. Wallace, 472 Cox, Jerry R., 540 Coyne, P.I., 303 Crested wheatgrass, 300

Crofts, Kent A., 118

Crooked calf disease, 29 Crossbreeding, 421 Croy, L.I., 276 Crude protein, 344 Cubed alfalfa hay or cottonseed meal-barley as supplements for beef cows grazing fallwinter range, 361 Cultural practices for establishing fourwing saltbush within perennial grass stands, 460 Currie, P.O., 361, 386

Data processing, 194 Dating past fires in curlleaf mountain-mahogany communities, 240 Davis, A.M., 29 Davis, C.A., 320 Davis, Lee G., 454 Dean, John G, 228 Deer and cattle competition, 18 Deer (mule), 18, 244, 521 Deer (red), 22 Deerbrush, 521 Defoliation (season of), 175 Dendrochronology, 241 Desert range, 531 Dewey, D.R., 261 Diet of guanaco and red deer in Neuquen Province, Argentina, 22

Diet quality of steers grazing three range sites in south Florida, 389

Dietary selection by goats and sheep in a deciduous woodland of northeastern Brazil.

Diets and liveweight changes of cattle grazing fall burned gulf cordgrass, 233

Differences in big sagebrush (Artemisia tridentata) plant stature along soil-water gradients: genetic components, 147

Digestibility of grasses, 264 Digestion (cattle), 139

Dill, T.O., 72

Disappearance of forage under short duration and season-long grazing, 496

Distribution of halogeton in North America,

Dobrowolski, James P., 46

Dolphin, A., 479 Donart, Gary B., 371 Doornbos, D.E., 421 Douglasfir, 272

Douglas-fir encroachment into mountain grasslands in southwestern Montana, 272

Drawe, D. Lynn, 233

Early root and shoot elongation of selected warm-season perennial grasses, 63

Eberlein, Gary P., 125 Eckert Jr., Richard E., 166, 409

Ecotone, 272 Effect of grazing stubble height and season on establishment, persistence, and quality of creeping bluestem, 223

Effect of herbicides and handweeding on establishment of kleingrass and buffelgrass, 547 Effect of season and regrazing on diet quality

of burned Florida range, 518 Effect of soil-surface morphology on emergence and survival of seedlings in big sage-

brush communities, 414. Effect of time of grazing in first crop year on subsequent productivity of Russian wildrye,

Effect of 20 years of low N rate pasture fertilization on soil acidity, 112

Effects of Adenosine monophosphate on germination of forage species in salt solutions,

Effects of brush control and game-bird management on nongame birds, 251

Effects of cattle grazing on mule deer diet and area selection, 18

Effects of cattle grazing on passerine birds nesting in riparian habitat, 254 Effects of N and P fertilizer placement on

establishment of seeded species on redistributed mine topsoil, 118

Effects of season and stage of rotation cycle on hydrologic condition of rangeland under intensive rotation grazing, 486

Effects of short-duration and continous grazing on bobwhite and wild turkey nesting,

Effects of soil-surface morphology on emergence and survival of seedlings in big sagebrush communities, 414

Effects of temperature and presowing treatments on showy menodora seed germination, 310

Effects of various grazing systems on type and density of cattle trails, 428

Efficacy of zinc phosphide and strychnine for black-tailed prairie dog control, 298 18-year comparison of control methods for Wyoming big sagebrush in southwestern Montana, 314

Ellinbank pasture meter, 475

Elvmus junceus, 513

Elytrigia repens × Pseudoroegneria, 300 Enhancing germination of spiny hackberry seeds, 552

Environments, 320 Eragrostis curvula, 276 Eragrostis lehmannia, 276

Eragrostis spp., 540 Erosion, 375, 486, 491, 500, 505

Erosion (gully), 558

Establishment of range grasses on various seedbeds at creosotebush Larrea tridentata, sites in Arizona, U.S.A., and Chihuahua, Mexico, 540

Estimating leaf area of big sagebrush from measurement of sapwood, 338

Estimating ratios of live and dead plant material in clipped plots, 90

Evaluation of the dry-weight-rank method for determining species composition in tallgrass

prairie, 283 Evaluation of total fecal collection for measur-

ing cattle forage intake, 2 Evans, Raymond A., 300

Evapotranspiration, 81 Everitt, J.H., 231

Experimental designs, 197

Exposition on the selection of appropriate experimental design and statistical analysis for pasture improvement research, 200

Fecal sampling, 2

Fertilization, 130 Fertilization effects on the phosphorus content of browse species, 231

Fertilization (experiments), 371 Fertilization (range), 482

Fertilizer (N), 118, 122, 125, 231 Fescue, 43, 272

Fescue (Arizona), 472 Fescue (rough), 182, 536

Fescue (tall), 40 Festuca arizonica Vasey, 472

Festuca arundinaceae, 40 Festuca scabrella, Torr., 182, 536

Festuca spp., 43, 272 Fiber, 344

Field evaluation of five grasses grown on a saline soil, 386

Fire effects, 233 Fire history, 241, 272

Fistula (rumen), 474 Fitzgerald, R.D., 13

Flatwoods range, 223, 389, 518 Flenniken, Kay S., 310, 450, 552

Flooding, 334

Flora and fauna associated with prairie dog colonies and adjacent ungrazed mixed-grass prairie in western South Dakota, 135

Flora changes following mechanical brush removal in Central Texas, 237

Foaling rate, 296 Food habits (deer), 521

Forage establishment: weather effects on stubble vs. fallow and fall vs. spring seeding, 228

Forage (harvested), 354 Forage intake, 2, 421

Forage production, 182, 300, 303

Forage quality, 231, 233, 264, 276, 354, 361, 386, 389, 396, 518, 521, 527

Forage quality of winterhardy lovegrasses,

Forage removal, 86

Forage selection, 13, 18, 22, 24, 392, 509

Forage utilization, 34, 496

Forage utilization cost differentials in a ranch operation: A case study, 34

Forage yield, 100, 296, 536 Forage yield and quality of warm- and cool-

season grasses, 264 Forest grazing, 13

Forest succession, 272 Fowler, John M., 194 Frank, A.B., 59

Fulbright, Timothy E., 310, 450, 552

### G

Gade, A.E., 527 Galyean, M.L., 2

Gamebirds, 259 Ganskopp, David, 207, 334, 338

Garza, N.E., 491. Gates, R.N., 72, 200

Gausman, H.W., 231 Genetic progress through hybridization of

induced and natural tetraploids in crested wheatgrass, 261 Germination of fourwing saltbush seeds: inter-

action of temperature, osmotic potential, and pH, 43

Germination of spiny hackberry, 562

Gibbens, R.P., 320 Gibbs, Kenneth C., 464 Gillen, R.L., 283 Gintzburger, G., 348 Goats, 24, 93

Godfrey, E. Bruce, 34 Goetz, Harold, 434 Gómez-Sosa, Edith, 341 Gomm, F.B., 261

Gradient analysis of vegetation dominated by two subspecies of big sagebrush, 156

Grama (blue), 371, 434, 509 Grama (sideoats), 63, 264, 460, 505 Grazing behavior, 207, 212

Grazing (continuous), 428, 482 Grazing costs, 290

Grazing (deferred rotation), 428

Grazing effects, 18, 254, 365, 431, 513, 514 Grazing fees, 34, 194 Grazing intensity, 166

Grazing preferences of cattle in regenerating aspen forests, 13 Grazing resistance, 443

Grazing (rotation), 486, 491 Grazing season, 175, 482, 518 Grazing (seasonlong), 496

Grazing (short duration), 217, 482, 491, 496, 500, 505, 509

Grazing stubble height, 223

Growth of forbs, shrubs, and trees on bentonite mine spoil under greenhouse conditions, 113

Growth rate, 348 Gruell, George E., 272 Grünwaldt, Eduardo G., 93

Gruver, Bradley J., 251 Guanaco, 22

Guard dogs, 293 Guiao, A., 320

Guthery, Fred S., 251, 259

Habitat use by feral horses in the northern sagebrush steppe, 207 Hackberry (spiny), 562 Halogeton, 281 Halogeton glomeratus, 281

Hand-portable single nozzle rainfall simulator designed for use on steep slopes, 375 Hansen, Richard M., 135, 139 Hanson, C.L., 81 Harris, Grant A., 46 Hart, Richard H., 228 Hatton, Thomas J., 91 Havstad, K.M., 421 Hay production, 354 Heitschmidt, R.K., 67, 428 Herbaceous biomass dynamics and net primary production following chemical control of honey mesquite, 67 Herozee production following litter removal on Alberta native grasslands, 536 Herbel, C.H., 320 Herbicidal efficiency, 547 Herbicide, 320 Herbicide conversion of a sand shinnery oak (Quercus havardii) community: effects on biomass, 399 Herbicide conversion of a sand shinnery oak (Quercus havardii) community: effects on nitrogen, 403 Herbicide effects, 251, 396, 399 Heterogeneity of data: implications for a variable federal grazing fee, 194 Hexazinone, 132 Hilken, Thomas O., 386 Hobbs, N. Thompson, 470 Holechek, Jerry L., 2 Holmes, J.H.G., 392 Holt, N.W., 513 Honey mesquite control with pelleted hexazinone in western Texas, 132 Horn, F.P., 276 Horses, 207 Horses, (feral), 296 Horton, W.H., 261 Hybrid vigor, 261 Hybridization (artificial), 261 Hybrids, 261, 386 Hyder, Syed Z., 104 Hydrologic characteristics of vegetation types as affected by livestock grazing systems, Edwards Plateau, Texas, 505

Hussey, Michael R., 369

Hydrology, 409 Huddleston, E.W., 320

Hudson, R.J., 13

# 3

Ibarra-F., Fernando, A., 540 Intermediate wheatgrass, 300 Impact of experimental design on the application of grazing research results-an exposition, 197 Impacts of black-tailed jackrabbits at peak population densities on sagebrush steppe vegetation, 152 Infiltration and sediment production following chemical control of sagebrush in New Mexico, 160 Infiltration rate, 160, 365, 371 Infiltration (soil), 486, 491, 500, 505 Infiltrometer, 375 Influence of breed on forage intake of range beef cows, 421 Influence of climate conditions and production of Stipa-Bouteloua prairie over a 50year period, 100 Influence of livestock trampling under intensive rotation grazing on soil hydrologic characteristics, The, 491 Interseeding, 59

Jackrabbits, 152
James, L.F., 344
Jameson, Donald A., 88
Jensen, K.B., 261
Johnson, D.A., 52, 300
Johnson, Mark K., 90, 454
Johnson, Patricia S., 91
Jones, Milton B., 475
Jones, Virgil, 396
Jordan, Gilbert L., 63

Juniper, 31, 237 Juniperus asheii, 237 Juniperus monosperma,, 438 Juniperus, spp., 31

# K

Kalmbacher, R.S., 223, 389, 518 Khalil, Jehangir, K., 104 Kie, John G., 521 Kilcher, M.R., 513 King, Rudy M., 298 Kirby, Donald R., 496, 509 Kleingrass, 540, 547 Klemmedson, J.O., 108 Knapp, B.W., 361 Knowles, Craig J., 249 Kothmann, M.M., 86, 217

Kronberg, S.L., 421

L

Lacey, John R., 290
Lama guanicoe, 22
Lama pacos, 424
LANDSAT, 268
Landscape management, 464
Lawrence, T., 513
Leaf area ratio, 303
Leckenby, Donavin A., 244
Legumes, 52, 59, 122
Lepus californicus, 152
Lindemann, W.C., 320
Linder, Raymond L., 298
Litter, 108, 160, 536
Lolium perenne, 40
Long, K.R., 389, 518
Lorenz, Jay R., 293
Lorenz, R.J., 59

Lovegrass, 63, 276, 540 Lupinus, spp., 29

# M

Maidencane, 389 Majak, W., 130 Malechek, John C., 24 Maltby, Michael, 474 Management of subterranean clover in pine forested range, 454 Marlow, Clayton B., 212 Martin, F.G., 223, 389, 518 Martin, Susana, 22 Martin-R., Martha H., 540 McDaniel, Kirk C., 160, 378 McFarland, M.L., 43 McGinnies, William J., 118 McKell, Cyrus M., 147 McMahon, Gregory L., 296 McPherson, Guy R., 327 Meadows (dry), 561 Measuring instruments, 475, 478 Medicago spp., 52, 59 Mediterranean zones, 348 Meganck, Richard A., 464 Meleagris gallopauo, 259

Menodora longiflora, 310 Merkle, M.G., 547 Merrill, L.B., 217 Mesquite, 67, 108, 132, 320, 327, 331, 378 Methods of enhancing germination of Anacua seeds, 450 Meurisse, Michael S., 414 Meyer, R.E., 547 Microsites, 414 Milkvetch (cicer), 457 Milkvetch (timber), 130 Miller, Richard, 338 Miller, William H., 474 Mine spoil reclamation, 113 Misertoxin, 130 Miserotoxin levels in fertilized Astragalus miser var. serotinus, 130 Modeling evapotranspiration from sagebrushgrass rangeland, 81 Morton, H.L., 320, 540

Morton, H.L., 320, 540 Mountainmahogany, 241 Mowing, 547 Muhlenbergia montana (Nutt.) Hitche, 472 Muhley (mountain), 472 Mulch, 536 Multiple use land, 464 Muttongrass, 472

# N

Needleandthread, 509 Neotoma spp., 31 Nielsen, Darwin B., 34 Nitrate reductase activity of kleingrass (Panicum coloratum) during drought in the northern Chihuahuan Desert, 531 Nitro compounds, 341 Nitrogen stress (plants), 531 Note on determining soil properties for soils containing rock fragments, 408 Nowak, Robert S., 443 Nutrient composition of Atriplex leaves grown in Saudi Arabia, 104 Nutrient content, 8, 509, 527 Nutrient content of browse, 5 Nutrient content of saltbush, 104 Nutrient content of sheep diets on a serpentine barrens range site, 8

barrens range site, 8

Nutrient cycling, 108, 399

Nutrition of sheep grazing crested wheatgrass versus crested wheatgrass-shrub pastures during winter, 527

Nutritive quality of ceanothus shrubs in California mixed conifer forest, 521

Nutritive value, 217, 396, 521

Nutritive value of forages on sandy soils as affected by tebuthiuron, 396

# 0

Oak, 237, 505
Oak (Gambel), 514
Observation on herbage growth, disappearance, and accumulation under livestock grazing, 86
Ocular estimates, 91
Odocoileus hemionus, 18, 244, 521
Optimal timing of investments to control honey mesquite, 378
Overstory-understory relationships, 521
Ovis aries, 24

D

Palatability, 276 Palo verde, 108

Oxytropis sericea Nutt., 344

Panicgrass, 63 Panicum coloratum, 531, 540, 547 Panicum hemitomon, 389 Panicum virgatum, 40 Parman, Mark, 509 Payne, Gene F., 314 Pearson, Henry A., 454 Pemberton, Robert W., 281 Percent consumption, 327 Peromyscus, boylii, 31 Pessin, Mark F., 496 Pesticide, 298 Petersen, J.L., 43, 132, 460 Peterson, Frederick F., 409, 414 Pettit, R.D., 396, 399, 403 Pfister, James A., 24, 344 Phytomass variation, 348 Phytosociological observations on the vegetation of burnt and unburnt areas near Ibadan, Nigeria, 76 Photosynthesis, 443 Photosynthetic characteristics of crested wheatgrass and bluebunch wheatgrass, 443 Physiological response, 113 Pine overstory, 454, 472 Pine (ponderosa), 241, 472 Pine-palmetto forest, 389 Pinus edulis, 31, 438 Pinus palustris, 389, 454 Pinus ponderosa, 241, 472 Pinyon, 31 Pipe model theory, 338 Pitman, W.D., 223 Pitt, Michael, D., 175 Plant competition, 43, 460 Plant competition (intraspecific), 156 Plant control, 31, 132 Plant control (biological), 281 Plant control (brush), 251, 314, 320, 327 Plant control (chemical), 141, 160 Plant phenology, 175 Plant succession, 434 Plow, 314 Plowing, 314
Poa fendleriana, 472 Poa spp., 166 Pogacnik, Thomas M., 212 Pointloco (white), 344 Poisonous plants, 130, 281, 341, 344 Pollination, 457 Pollination requirements of cicer milkvetch, Astragalus cicer L., 457 Polyploidy, 147, 261 Population dynamics of seeded species on northeast Washington semiarid sites, 1948-1983, 46 Population recovery of black-tailed prairie dogs following control with zinc phosphide, Populus tremuloides, 13 Potter, R.L., 43, 132, 460 Powell, J., 354 Prairie, 135, 354, 434 Prairie dog population control, 249 Prairie dogs, 135, 298 Prairie lands, 290 President's Address, 98

Private lands, 290

Prosopis juliflora, 108

Pseudoreplication, 197

Provenza, F.D., 527

Protein supplements, 361

Psathyrostachys juncea, 264

Pseudotsuga menziesii, 272

378

Prosopis glandulosa, 67, 130, 320, 327, 331,

Rainfall simulator, 375 Ralphs, M.H., 217, 344 Ranch economics, 34, 290, 293, 378 Range condition, 409, 561 Range economics, 194 Range improvement, 125, 130, 141, 228, 237, 378 Range inventory, 565 Range management and scenic beauty as perceived by dispersed recreationists, 464 Range seeding, 310 Range revegetation, 300 Range terminology, 86 Ratliff, Raymond, D., 482 Rawls, W.J., 408 Ray, Ian, M., 531 Reed, Jess D., 5 Reference unit-based estimates of winter browse weights, 187 Regression analyses, 100 Reiner, Richard J., 424 Reitzel, J.A., 320 Relation between ecological range condition and proportion of soil-surface types, 409 Relationships among soluble phenolics, insoluble proanthocyanidins and fiber in east African browse species, 5 Relationships of the error associated with ocular estimation and actual total cover, 91 Relative growth rate, 303, 348 Render, Jeffrey H., 454 Renovation, of seeded warm-season pastures with atrazine, 72 Replication, 200 Research technique, 197 Responses of vegetation and ground cover to spraying a high elevation, big sagebrush watershed with 2,4,-D, 141 Rest period, 314 Rest-rotation, 166 Retam retam, 348 Revegetation, 113, 228, 438, 460, 555 Revegetation (natural), 414 Ribbeck, Kenneth F., 454 Richards, K.W., 457 Richman, D.B., 320 Riggs, Robert A., 514 Riparian ecosystem, 212, 254 Rising plate meter for estimating production and utilization, 475 Rodent control, 249, 298 Rodenticide, 298 Rodents, 31 Rollins, Dale, 237 Root growth, 331 Root: shoot ratios, 63 Rosiere, R.E., 8 Rotocut, 314 Rumbaugh, M.D., 52 Rumen analysis, 139 Rumen cannula for small ruminants, 474 Rumen digestive capability of zebu steers in

Public land grazing, 194

Public relations, 464

Quercus grisea, 438

R S hybrid, 300

Quercus havardii, 399

Rabbitbrush, 152, 334

Rainfall simulation, 375

Radio telemetry, 296

Quercus virginianus, 505

Quercus, 237 Quercus gambelii, 514 wet and dry seasons, 139 Ruminant nutrition, 2 Rupoff 160 Runoff (stream), 558 Ryder-White, J.A., 320 Ryegrass, 40 Sagebrush, 141, 147, 152, 156, 160, 314, 334, Sagebrush-grass range, 81, 166, 409 Saltbush, 104 Saltbush (fourwing), 43, 460 Sampling methods, 88, 90, 200, 283, 375, 474, 561, 565 Sand dunes, 348 Sanderson, H. Reed, 464 Sapwood area, 338 Sarcobatus vermiculatus, 334 Saskatchewan, 513 Satellite imagery, 268 Sawaya, Wajih N., 104 Sbriller, Alicia Pelliza, 24 Scarification, 310 Scarnecchia, D.L., 86, 471 Schaalje, G.B., 182 Schizachyrium scoparium, 264 Schizachyrium stoloniferum, 223, 518 Schultz, R.D., 67 Schulz, Paul, 259 Scifres, C.J., 67 Scrivner, Jerry H., 475 Sears, W.E., 399, 403 Seasonal and annual changes in biomass nitrogen and carbon of mesquite and palo verde ecosystems, 108 Seasonal variation in above-ground annual and perennial phytomass of an arid rangeland in Libya, 348 Sedges, 434 Sediment yields, 160, 371, 558 Seed germination, 43, 310 Seed germination rate, 300 Seed prechilling, 450 Seed (pure live), 457 Seed scarification, 450 Seedbed ecology, 300 Seedbed preparation, 540, 555 Seeding (broadcast), 555 Seeding (range), 43, 46, 228, 540 Seedling establishment, 52, 59, 63, 513 Seedling survival, 414 Serenoa repens, 389 Serpentine barrens, 8 Severson, Kieth E., 31, 438 Sharma, B.M., 76

Short duration grazing in central New Mexico: effects on infiltration rates, 365 Showy mendora, 310 Shrub ecosystems, 562 Shrub genetics, 147

Shrub volume, 254
Shumar, Mark L., 152, 156
Simanton, John Roger, 63, 478
Sisson, William B., 531
Skinner, Quentin D., 369
Small mammals in modified pinyon-juniper

Sheep, 8, 24

Shinnery oak, 399

Shoot growth, 331

Small mammals in modified pinyon-juniper woodlands, New Mexico, 31 Smith, E.L., 283

Smoliak, S., 100, 182, 536 Snowberry, 13 Soil analysis, 122, 156, 408 Soil surfaces, 409, 414 Soil water, 81, 147, 408, 531

Soils (saline), 40, 386

Some impacts of 2,4,5-T on a mesquite duneland ecosystem in southern New Mexico: a synthesis, 320

Sosa, Roberto, 93 Spartina spartinae, 233 Spencer, John S., 166 Spraying, 314 Squirreltail. 472

Stadler, S.J., 354 Statistical analyses, 200 Stephens, Jennifer L., 414 Stephenson, G.R., 408

Stipa comata, 509 Stipa leucotricha, 505 Stout, D.M., 29 Stream contamination, 369

Strip mining, 118 Stroup, W.W., 72, 200 Strychnine, 298

Sturges, David L., 141 Stuth, Jerry W., 233

Sulfur or sulfur plus nitrogen increases beef production on California annual range, 125

Summer range, 431 Supplemental feeding, 361 Switchgrass, 40

2,4-D, 141 2,4,5-T, 67, 320 Tallgrass-prairie, 354 Tannins, 5

Taylor, Daniel M., 254 Taylor, C.A.,Jr., 486, 500, 505 Tebuthiuron, 396, 399, 540

Teratogen, 29 Threeawn, 505 Threshold requires

Threshold requirements for burning downed honey mesquite, 327 Thurow, T.L., 491, 505 Tillering, 536

Tolerances of sagebrush, rabbitbrush, and

greasewood to elevated water tables, 334

Torrell, L. Allen, 34, 194, 378
Toxic nitro compounds in species of Astragalus (Fabaceae) in Argentina, 341
Transplanting, 460
Trifolium subterraneum, 454
Tromble, John T., 375
Tropics (semiarid), 24

U

Ueckert, D.N., 43, 132, 460 Undersander, D.J., 40 Unit leaf rate, 303 Uresk, Daniel W., 113, 135, 298 Urness, Philip, J., 18, 514

Turkey, (wild), 259

Use of the FW-1 water level recorder for control of electrical equipment, 478 Utilization of white locoweed (Oxytropis sericea Nutt.) by range cattle, 344

V

Van Rees, H., 392
Vaughn, Charles E., 8
Vavra, Martin, 207
Vegetal change in the absence of livestock grazing, mountain brush zone, 514
Vegetation inventory, 268
Vegetation of exclosures in southwestern North Dakota, 434
Vegetation response on allotments grazed under rest-rotation management, 166
Vegetation responses to long-term sheep grazing on mountain ranges, 431
Velvet mesquite seedling development in three southwestern soils, 331

Viewpoint: Animal-unit equivalents cannot be meaningfully weighted by indices of dietary overlap, 471

Viewpoint: Animal-unit equivalents should be weighted by dietary differences, 470 Vogel, K.P., 72 Voigt, P.W., 276 u

Waggerman, Gary L., 450, 552 Walker, John W., 428 Wallace, Joe D., 2 Waller, S.S., 72, 197, 200 Wambolt, Carl L., 314 Ward, Timothy J., 375 Warm-season plants, 63, 72, 122 Warren, S.D., 486, 491, 500 Water quality, 369 Water spreading, 334 Water stress (plants), 531 Water-use efficiency, 300, 303 Watershed management, 141 Watershed techniques, 375 Weather factors affecting 22 years of tallgrass prairie hay production and quality, 354 Weather severity index on a mule deer winter range, 244 Weight gains (cattle), 125 Weltz, Mark, 365, 371 West, Neil E., 91, 187 Wester, D.B., 399, 403 Wheatgrass (bluebunch), 175, 314, 443 Wheatgrass (crested), 40, 264, 300, 443 Wheatgrass (intermediate), 300 Wheatgrass ssp., 43, 261 Wheatgrass (western), 509 White, Larry M., 264 White, Richard S., 386 Whitethorn (mountain), 521 Wight, J. Ross, 81 Wikeem, B.M., 130 Wilcox, Bradford P., 375 Wildlife habitat management, 450, 562 Wildrye (Russian), 264, 513 Williams, M. Coburn, 341 Willms, W.D., 182, 536 Wilson, Andrew E., 240 Wilson, R.E., 478 Wilton, A.C. 59 Winter grazing, 527 Winterfat, 152, 187 Wintergrass, 233, 505 Wofford, Helen, 2

Wolters, Gale L., 125